



Newsletter

Volume 15, Number 2
March - April 1998

It has been just over 10 years since we sent a questionnaire to *IES Newsletter* readers. It's time to ask you again about your interests and preferences, so a new survey is enclosed in this issue.

From the 1987 questionnaire, we learned that readers most enjoyed articles about current research and education programs, as well as about local ecology and natural history. The calendar also earned high marks! The story that was most remembered, by far, was one that ran in the July-August 1986 issue called "Ecology of the Lyme Tick". This article described how IES scientists first started looking for what are now called black-legged ticks in 1984, and how the first Lyme disease bacteria were found the following year. (See "IES Notes" on page 2 of this issue for news of the latest findings in our ongoing research into the ecology of Lyme disease.)

We would appreciate it if you would take five minutes to fill out the 1998 questionnaire and send it back to us. Thank you, in advance, for offering your opinions.

The *IES Newsletter* is published by the Institute of Ecosystem Studies, located at the Mary Flagler Cary Arboretum in Millbrook, New York.

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Songbird Nests: Snack Bars for Small Mammals?

There's no shortage of hypotheses as to why songbird populations seem to be declining. Articles in popular magazines and scientific journals alike report causes that include tropical deforestation that destroys winter habitat; habitat fragmentation in the summer breeding habitats; coastal development with a resulting loss of migratory stopover areas; global climate change; and pesticide pollution. Also proposed as factors that have a significant negative impact on migratory birds are predation by domestic cats, increasing numbers of towers and tall buildings with non-reflective glass (hence, increased incidence of fatal collisions) and even hunting: in some parts of the world, songbirds are trapped in nets and used for human food.

Now, new research at the Institute of Ecosystem Studies will address another potential cause of songbird decline: how often do their eggs and nestlings become meals for small mammals. Dr. Kenneth Schmidt, an IES postdoctoral associate, is assessing predation by small mammals on the nests of ground-dwelling songbirds.

Previous studies elsewhere have looked at mice as predators of ground-nesting birds' eggs. Some of these studies used quail eggs as "bait" in the nests, and while results suggested that mice were not significant predators, researchers now suspect that the relatively large size of quail eggs may have discouraged predatory behavior by smaller mammals. Last summer IES Research Experiences for Undergraduates student Robert Naumann (a senior at The University of Michigan, Ann Arbor) did a nest preda-

tion study on parcels of land from which white-footed mice had been removed. These mouse-free research plots, located in the forests of the Mary Flagler Cary Arboretum, were part of the Lyme disease and gypsy moth study done by IES ecologists Richard Ostfeld and Clive Jones (see page 2). Mr. Naumann put out artificial nests baited with zebra finch eggs and clay eggs, and by noting the tooth marks on the latter identified the predators that were attacking the nests. He found significantly more predation in the control plots, where mice remained, than in the mouse-free experimental plots.

Dr. Schmidt's research focus this summer will be on the role that chipmunks play in nest predation. In mid-May, in the Arboretum's oak forests, he will locate wood thrush nests in shrubs, and veery and ovenbird nests on the ground. He will remove all chipmunks from three experimental plots, relocating the animals at Arboretum sites far enough from the study sites that they will not return. He will also set up three matched control plots, where chipmunk populations will remain as they are. He then will check the nests every three days to look for evidence of predation. This study will be the first time that rodents have been removed from areas specifically to observe their effects on natural songbird nests.

Dr. Schmidt plans other research as well. For one thing, he is interested in learning how nest predation differs between fragmented forests, where edges invite

continued on page 3



Dr. Kenneth Schmidt checks for egg predation in a songbird nest.

MOLLY AHEARN

Endangered Art, Endangered Species

Dr. David Strayer was doing some scientific sleuthing back in 1985, in the course of preparing a monograph on freshwater mollusks, when he visited the Academy of Natural Sciences in Philadelphia. There, in the museum's archives, he came across a collection of extraordinary illustrations. Investigating further, he found that these long-forgotten works of art, all of exceptional beauty and fidelity, had been done by three different scientific illustrators over several years beginning in 1906. They had been prepared for a monograph, *Land and Fresh Water Mollusca of New York*, written by Academy of Natural Sciences scientist Henry A. Pilsbry. In 1925, when it turned out that money for printing the publication was not available, Dr. Pilsbry stored the work in his files. Upon his death in 1957 it was transferred to the archives, where Dr. Strayer found it.

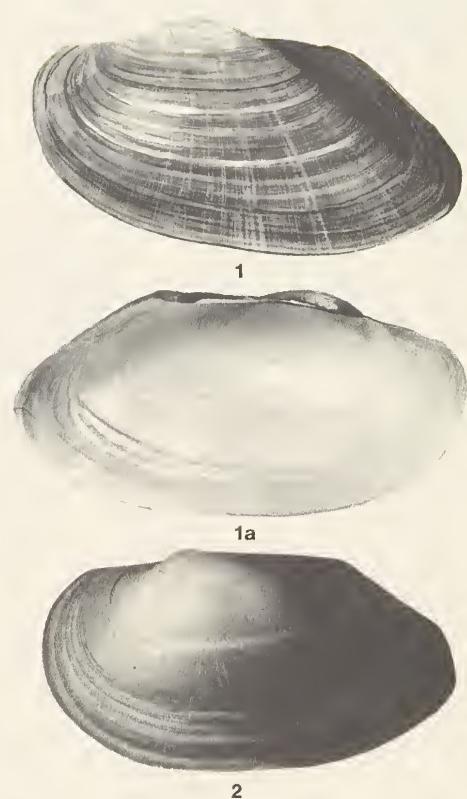
Several years ago Dr. Strayer received permission to use the paintings in a new monograph of his own, *The Pearly Mussels of New York State*, which he co-authored with Dr. Kurt J. Jirka, a biologist with Ichthyological Associates of Lansing (near Ithaca, N.Y.), has just been published by the New York State Museum. The book, which summarizes the distributions, past and present, of the state's pearly mussels, includes all the original scientific illustrations, which, through the wizardry of scanning and digitization, were recreated without any modification or harm to the valuable old plates.

Pearly mussels (phylum Mollusca, order Unionoida) are one of the richest groups

of organisms in the streams and rivers of eastern North America, with about 300 species. Economically important animals, their thick, lustrous shells were once a source of mother-of-pearl; more recently, bits of their shells have been used as nuclei for cultured pearls. The fishery for unionoid shells is worth about \$40 million per year in the United States. They are also ecologically important, and because they are sensitive to many types of pollution, their presence and diversity can be a useful indicator of water quality.

The Pearly Mussels of New York State fully documents the biology and geography of these animals. Human influences on their populations are also described, as are continuing and future threats such as the relatively recent zebra mussel invasion. The authors write: "Large numbers of zebra mussels — often hundreds to thousands per unionoid — attach to the exposed parts of unionoid shells, interfering with the normal activities of the unionoid and eventually killing (it)." The second part of the book includes keys, illustrations and descriptions of the shells of 56 species of pearly mussels, all from New York state.

The Pearly Mussels of New York State may be purchased from Publication Sales, New York State Museum, Cultural Education Center, Albany NY 12230, for \$50 + \$4 shipping and handling. ■



Pyganodon cataracta (Plate 14, from *The Pearly Mussels of New York State*)
Drawings 1 and 1a are of a specimen taken from a pond near Dover Plains, N.Y., and were drawn by Helen Winchester. Drawing 2 is of a mussel from Black Rock Pond, Albany, N.Y., and was drawn by George S. Barkentin.

IES Notes

• IES scientists Dr. Clive G. Jones, Dr. Richard S. Ostfeld, Ms. Michele P. Richard and Mr. Eric M. Schaefer, and collaborator Dr. Jerry O. Wolff (Oregon State University) have shown that Lyme disease risk and gypsy moth outbreaks are a direct consequence of the interactions among a diversity of species within an oak forest ecosystem. These findings, and what they reveal about the complexity of nature, are reported in the 13 February 1998 issue of the journal *Science*. In their paper, the collaborators describe a study in which forest plots at the Institute were experimentally manipulated, initially by removing the white-footed mice and then by adding acorns. And their conclusions? First, acorns determine mouse survival and reproduction and therefore how many white-footed mice there are. Second, high or low numbers of mice can respectively suppress or release gypsy

moth outbreaks via changes in pupal predation. And, finally, large acorn crops attract deer and mice to oak forests, resulting in high numbers of host-seeking ticks right at the time that mice infected with the bacteria are most numerous.

- A conference on Landscape Use of Native Plants, sponsored by the Cornell Cooperative Extension Associations and held in Latham, N.Y. in March, featured presentations by two IES staff members. Ms. Judith Sullivan, native plant gardener, spoke on "The Ethics of Native Plants and Seed Sources", and Ms. Elizabeth Ashton, perennial gardener, spoke on "Creative Native Landscape Design".
- Dr. Steward T.A. Pickett is collaborating with scientists at the University of Washington and the University of Witwatersrand (Johannesburg, South Africa) on a project to initiate a cooperative research and education program on the ecology of riparian forests (forests along streams and rivers) in South Africa. The two-year preliminary project, funded by The Andrew W. Mellon Foundation, will include identification of key faculty in South Africa, establishment of an exchange program for graduate students from the USA and South Africa, development of pilot research and education projects and the preparation of a comprehensive proposal for a long-term study.
- The Institute's annual Volunteer Recognition Ceremony was held on April 16. IES currently has 84 volunteers, and over the past year they have contributed 3,863 hours of their valuable time to a range of research, education, horticulture and administrative projects. The display gardens — the Perennial Garden and the

IES NEWSLETTER READER'S SURVEY
Spring 1998

What are your reading preferences in the *IES Newsletter*? (check all that apply)

- | | | | |
|--|---------------------------------------|---|--------------------------------------|
| articles about current IES research | <input type="checkbox"/> enjoy highly | <input type="checkbox"/> enjoy somewhat | <input type="checkbox"/> read rarely |
| local ecology/natural history features | <input type="checkbox"/> enjoy highly | <input type="checkbox"/> enjoy somewhat | <input type="checkbox"/> read rarely |
| articles about IES education programs | <input type="checkbox"/> enjoy highly | <input type="checkbox"/> enjoy somewhat | <input type="checkbox"/> read rarely |
| horticultural features | <input type="checkbox"/> enjoy highly | <input type="checkbox"/> enjoy somewhat | <input type="checkbox"/> read rarely |
| "IES Notes"; stories about IES personnel | <input type="checkbox"/> enjoy highly | <input type="checkbox"/> enjoy somewhat | <input type="checkbox"/> read rarely |
| calendar of IES events | <input type="checkbox"/> enjoy highly | <input type="checkbox"/> enjoy somewhat | <input type="checkbox"/> read rarely |

Please explain:

What other features would you enjoy?

Has your knowledge of/interest in ecology been enhanced by articles you have read in the *IES Newsletter*?

- yes somewhat no — already high no — articles didn't influence me

Please explain:

Have newsletter articles inspired you to:

- do further reading on a subject?
 explore an ecological phenomenon in the out-of-doors?
 teach an ecological concept, or concepts, to others?
 rethink the way you look at the natural world?
 visit the Institute?
 enroll in IES Continuing Education Program courses, workshops and/or excursions?
 become an IES Volunteer?

The articles about IES research are:

- too technical not technical enough just right

How could we improve the *IES Newsletter*?

What is your occupation?

What is your Zip Code?

Are you currently (check all that apply):

- an IES Continuing Education Program student? an IES Volunteer?
 a member of IES? a member of the Institute's Aldo Leopold Society?

How do you receive the newsletter?

- by mail from the Visitor Information table at the Institute
 other: _____

Comments:

(if necessary, continue your comments on the reverse side of this panel)

After you've completed the questionnaire, please fold, tape closed and mail. The postage is already paid. Thank you for helping us design the *IES Newsletter* to your needs and interests.

— Jill Cadwallader, editor



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(continue your comments here)

Dr. Likens Honored Near and Far

Over the past months, IES director Dr. Gene E. Likens has received three prestigious honors, locally, in The Netherlands, and in Canada.

- In November 1997, Dr. Likens was recognized by The Hudson River Environmental Society, Inc. for his ecosystem research, and was presented with the organization's Distinguished Service Award.
- Only once every five years does the Wageningen Agricultural University, a world center for agricultural and environmental science located in The Netherlands, bestow an honorary doctoral degree. In March 1998, on the occasion of the University's 80th anniversary, this prestigious award was given to Dr. Likens. He was honored for his pioneering research on the interface between environment and ecology. Nico van Breemen, Professor of Soil Formation and Ecopedology (soil ecology) at the university, read the laudatio for the honorary doctorate, and spoke of Dr. Likens' contributions that "revolutionized (scientific) thinking". First, he and his colleagues in the Hubbard Brook Ecosystem Study discovered how closely vegetation regulates the chemistry and physics of soils and surface waters, and, second, they discovered acid rain and its adverse ecological effects in North America. "With IES as a platform," continued Prof. van Breemen, "you helped build bridges between ecological disciplines ... (and) you have always been strongly aware of your responsibility to



Dr. Gene E. Likens holds the diploma presented by Wageningen Agricultural University. To his left is Professor Nico van Breemen.

society. You produced more communications to laymen about adverse environmental impacts of human activities than most colleagues wrote research papers." With that, the University's Rector Magnificus, Professor C.M. Karssen, presented Dr. Likens with a diploma.

- Later in March, Dr. Likens traveled to Burlington, Ontario to receive the 1997 Vollenweider Lectureship Award. Ten years ago, Canada's National Water Research Institute established the R.A. Vollenweider Lectureship in Aquatic Sciences, an annual award to a freshwater

scientist in recognition of his or her contributions to excellence in international research and scientific leadership. Dr. Likens was selected to receive the award "as a tribute to (his) significant contributions to the study of biogeochemical processes in forest, stream and lake ecosystems". After the presentation of the award, which was signed by The Honorable Christine Stewart, Canadian Minister of the Environment, Dr. Likens spoke to a gathering of some 300 scientists on "Acid Rain and Calcium: Long-term Studies at Hubbard Brook". ■

Songbird Nests, from page 1

Fern Glen — topped the list with 26 volunteers and over 1200 hours of propagating, planting, weeding and mulching. Ms. Jean Pizzola was recognized for contributing the most hours for the 12 month period: 447, in the display gardens and the greenhouse. Fourteen other volunteers were commended for 100 hours or more of service. After a reception and dinner in the Plant Science Building, volunteers and their IES supervisors and colleagues moved on to the auditorium. There, the recognition ceremony began with an overview and update of Institute programs by Dr. Likens, and a talk by Dr. Peter Groffman on "Humans and Other Exotic Species in Ecosystems". (See the Calendar on the back page for information on how to become an IES Volunteer.) ■

predators like raccoons and blue jays, and intact woods, where these animals are rare. Given the large expanse of intact forest at the Arboretum, as well as a number of edge habitats, he will have ample space for field work. In addition, he hopes to investigate "compensatory mortality" — if one of the many songbird predators is removed, will another predator take over? Such research has important management implications, as it would indicate that eliminating an apparently significant predator would not improve the songbirds' lot in life. Finally, in the course of earlier research, Dr. Schmidt began collecting data relating to songbirds' apparent preference for invasive exotic shrubs as nest sites. While at IES he will continue to pursue this question, studying songbirds nesting in *Ailanthus* and honeysuckle, both exotic species, and in the native *Viburnum* and dogwood.

Dr. Schmidt believes that ecological relationships in oak forests have a definite impact on songbird reproduction and survival — during summers following large acorn production, called mast years, rodents thrive and it becomes more likely that songbird eggs fall victim to their foraging. The result, at the very least, could be short-term fluctuations in songbird populations. The results of Dr. Schmidt's research at IES will help address this question.

As a postdoctoral associate, Dr. Kenneth A. Schmidt will be at the Institute for two years, collaborating with IES animal ecologist Dr. Richard Ostfeld. Dr. Schmidt did his thesis research on predation of wood thrush and robin nests in the Chicago area, and received his Ph.D. in 1997 from the University of Illinois at Chicago. ■

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CONTINUING EDUCATION

For a spring 1998 catalogue and program information, call the Continuing Education office at 914/677-9643. Programs during May and June include:

Gardening

May 30: The French Kitchen Garden in America

May 31: Wild Plant Identification: Late Spring

June 20 or 27: Designing a Perennial Border for All Seasons

June 20: Old Garden Roses

June 27: Adapting Oriental Garden Principles to the American Landscape

June 28: Wild Plant Identification: Early Summer

Natural Science Illustration

May 16-19: Pen and Ink II: Plant Illustration

May 18: Sketching at Millbrook's Zoo

May 19: Graphite Techniques in the Garden

Workshops

May 14: Wetland Creation and Restoration: A Hands-on Experience

Ecological Excursions and Garden Tours

May 16: Ecology of the Shawangunks and Exploration of the Dwarf Pine Barrens

May 30: Pawling Nature Reserve

June 6: Kykuit and PepsiCo Gardens and Sculpture

June 13: Wander the Wappinger Creek

June 14: Michael Pollan's Second Nature Garden and the Sharon Audubon Center

June 20: Mohonk: The Mountain House, Gardens, Lake and History

June 21: Wave Hill and The Cloisters

June 27: Caprilands Herb Farm

June 28: Catnip Acres Herb Gardens and Gertrude Jekyll's Glebe House Garden

IES SEMINARS

Free weekly scientific seminars are held from mid-September through early May. Look for the fall schedule in the July-August issue of the newsletter.

Calendar

SUNDAY ECOLOGY PROGRAMS

Free public programs are offered on occasional Sundays. Call 914/677-5359 to confirm the day's topic or, in case of poor weather, to learn the status of the day's program. Meet at 2 p.m. at the Gifford House on Route 44A for:

May 17: Super Soil: The World Beneath Our Feet, a walk and demonstration led by Mr. Alan Lorefice

June 7: Environmental Monitoring Program and Tour of the IES Weather Station, led by Ms. Vicki Kelly

July 12: A Stream Walk, led by Dr. David Strayer

• We recommend that participants wear long pants tucked into socks and sturdy waterproof shoes for all outdoor programs.

VOLUNTEER OPPORTUNITIES

Summer is our busiest time, and volunteers who enjoy working with people will have lots to do! For information on volunteering with visitor reception, or in other areas at IES, call Ms. Su Marcy at 677-7641.

GREENHOUSE

The IES greenhouse, a year-round tropical plant paradise and a site for controlled environmental research, is open until 3:30 p.m. daily except public holidays. Admission is by free permit (see "HOURS").

HOURS

Summer hours: April 1 - September 30

Public attractions are open Mon. - Sat., 9 a.m.-6 p.m. & Sun. 1-6 p.m., with a free permit*.

The IES Ecology Shop is open Mon.- Fri., 11a.m.-5 p.m., Sat. 9 a.m.-5 p.m. & Sun. 1-5 p.m. (The shop is closed weekdays from 1-1:30 p.m.)

IES is closed on public holidays.

* Free permits are required for visitors and are available at the IES Ecology Shop or the Education Program office daily until one hour before closing time.

IES ECOLOGY SHOP

New in the Shop ... floral theme scrapbooks, photo albums, memory books ... for children ... books: "Portable Pets", "Nature Search", "Discovery Box" ... and in the Plant Room ... herbs from the IES Greenhouse, geraniums and foliage plants

Senior Citizen Days: 10% discount on Wednesdays

• Gift Certificates are available •

MEMBERSHIP

Join the Institute of Ecosystem Studies. Benefits include subscription to the newsletter, member's rate for courses and excursions, a 10% discount on IES Ecology Shop purchases, and participation in a reciprocal admissions program. Individual membership: \$30; family membership: \$40. Call Ms. Janice Claiborne at 677-5343.

The Institute's Aldo Leopold Society In addition to receiving the benefits listed above, members of The Aldo Leopold Society are invited guests at spring and fall IES science updates. Call Ms. Jan Mittan at 677-5343.

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